**Name:** _____

# EOC FSA
# Practice Test



DEPARTMENT OF
MATHEMATICS, SCIENCE, & GIFTED

Ma Sc
Gi

BROWARD COUNTY PUBLIC SCHOOLS

# Algebra 1

## Calculator Portion

**Compiled by the Broward County Public Schools**
**Office of Instruction and Intervention**
**Mathematics, Science, & Gifted Department**

# Algebra 1 EOC FSA Mathematics Reference Sheet

## Customary Conversions

1 foot = 12 inches
1 yard = 3 feet
1 mile = 5,280 feet
1 mile = 1,760 yards

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts

1 pound = 16 ounces
1 ton = 2,000 pounds

## Metric Conversions

1 meter = 100 centimeters
1 meter = 1000 millimeters
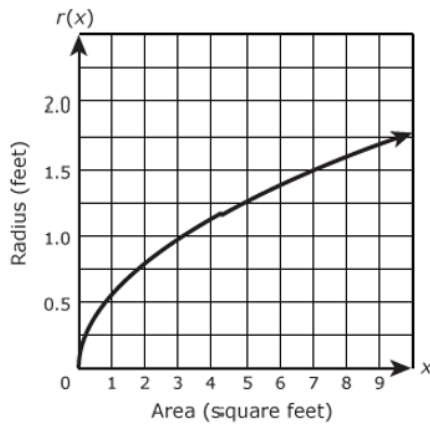1 kilometer = 1000 meters

1 liter = 1000 milliliters

1 gram = 1000 milligrams
1 kilogram = 1000 grams

## Time Conversions

1 minute = 60 seconds
1 hour = 60 minutes
1 day = 24 hours
1 year = 365 days
1 year = 52 weeks

## Algebra 1 EOC FSA Practice Test (Calculator Portion)

____  **1** The function $r(x)$ represents the radius of a circle for a given area $x$. A graph of the function is shown in the figure.



According to the graph, what is the approximate average rate of change in the radius of the circle as the area increases from 3 square feet to 7 square feet?

Ⓐ  0.125 foot per square foot
Ⓑ  0.25 foot per square foot
Ⓒ  0.5 foot per square foot
Ⓓ  8 feet per square foot

____  **2** Which of the following correlation coefficients indicate a strong linear correlation?

Ⓐ  −0.872691
Ⓑ  −0.658799
Ⓒ  −0.125866
Ⓓ  0.568962
Ⓔ  0.798264
Ⓕ  0.989862

**3**  The ordered pairs (20, -29.5), (21, -31) and (22, -32.5) are points on the graph of the linear equation. Graph the line that shows all of the ordered pairs in the solution set of this linear equation.
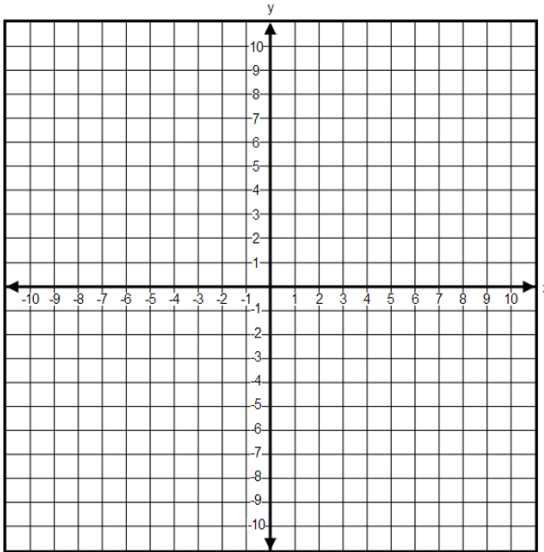


**4**  Fill in the missing portions of the function to rewrite $g(x) = 3x^2 - 33x - 180$ to reveal the zeros of the function. What are the zeros of $g(x)$?

Enter your answers in the boxes.

$g(x) = 3(x + \boxed{\phantom{xxxxx}})(x - \boxed{\phantom{xxxxx}})$

Zeros: $\boxed{\phantom{xxxxx}}$ and $\boxed{\phantom{xxxxx}}$

5 A function is shown.

$$f(x) = x^2 + 2x - 48$$

One of the zeros of the function is $x = 6$.

What is the other zero of the function?

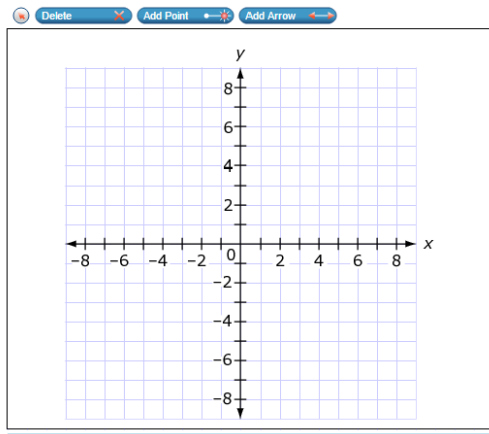| 1 | 2 | 3 | $x$ |
|---|---|---|---|
| 4 | 5 | 6 | + | - | * | ÷ |
| 7 | 8 | 9 | < | ≤ | = | ≥ | > |
| 0 | . | - |

6 A linear function is represented in the table shown.

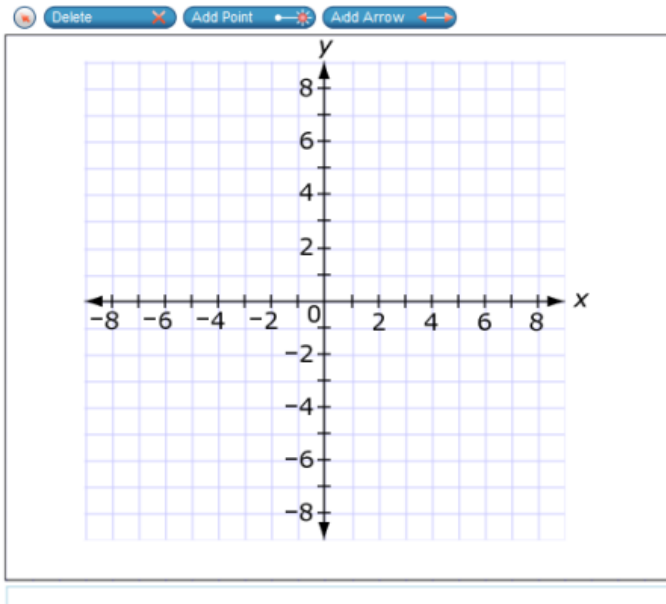| $x$ | $y$ |
|-----|-----|
| −1 | −6 |
| 1 | −2 |
| 3 | 2 |

Draw a line on the coordinate grid that has a greater $y$-intercept than the function represented by the table and is perpendicular to function $y + \dfrac{1}{4}x = 2$

**7** A Linear equation is shown.

$2x + 3y = 6$

Graph this equation.



**8** An artist uses tiles to create a design. The design is created in stages and the total number of tiles the artist uses in each stage follows a pattern, as shown in the table.

**Artist's Design**

| Stage Number | Total Number of Tiles |
|---|---|
| 1 | 1 |
| 2 | 3 |
| 3 | 5 |
| 4 | 7 |
| 5 | 9 |
| 6 | 11 |
| 7 | 13 |

Create an equation that models the number of tiles in a given stage.

____ **9** A local theater sells admission tickets for $9.00 on Thursday nights.  At capacity, the theater holds 100 customers.  The function $M(n) = 9n$ represents the amount of money the theater takes in on Thursday nights, where n is the number of customers. What is the domain of M(n) in this context? Select the correct answer.

   Ⓐ all whole numbers
   Ⓑ all non-negative rational numbers
   Ⓒ all non-negative integers that are multiples of 9
   Ⓓ all non-negative integers less than or equal to 100

____ **10** Jerome is constructing a table of values that satisfies the definition of a function.

| Input | −13 | 20 | 0 | −4 | 11 | −1 | 17 | |
|---|---|---|---|---|---|---|---|---|
| Output | −15 | −11 | −9 | −2 | −1 | 5 | 5 | 13 |

What number(s) can be placed in the empty cell so that the table of values satisfies the definition of a function?
Select all that apply.
   Ⓐ -5
   Ⓑ -1
   Ⓒ 0
   Ⓓ 2
   Ⓔ 11
   Ⓕ 17

**11** When the solutions to each of the two equations are graphed in the xy-coordinate plane, the graphs of the solutions intersect at a point.

$$y = x^2 - 2x - 5$$
$$y = x^3 - 2x^2 - 5x - 9$$

What is the y-coordinate of the point of intersection?
Enter your answer in the box.

$y = $ _____

____ 12 You find a line of fit for a set of data and calculate that the correlation coefficient for the model is –0.34. Which statement best describes the fit of the model to the data?

(A) The correlation coefficient suggests a strong positive correlation, so this model is a good fit for the data.

(B) The correlation coefficient suggests a weak positive correlation, so this model is a not a good fit for the data.

(C) The correlation coefficient suggests a weak negative correlation, so this model is a not a good fit for the data.

(D) The correlation coefficient suggests a strong negative correlation, so this model is a good fit for the data.

13 A quadratic equation is shown.

$$x^2 - 6x - 72 = 0$$

What is the factored form of the quadratic equation?

| 1 | 2 | 3 | $x$ | | | | | | | | | |
| 4 | 5 | 6 | $+$ | $-$ | $*$ | $\div$ | | | | | | |
| 7 | 8 | 9 | $<$ | $\le$ | $=$ | $\ge$ | $>$ | | | | | |
| 0 | . | $-$ | $\frac{0}{0}$ | $\Box^\Box$ | $\Box_\Box$ | $()$ | $||$ | $\sqrt{\Box}$ | $\sqrt[\Box]{\Box}$ | $\pi$ | $i$ | |

____ 14 Morgan drops a rock from a bridge that is 30 meters above the river. The height of the rock in meters, $h$, after $t$ seconds is modeled by the function shown.
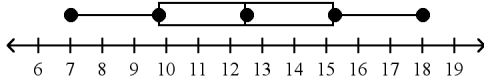
$$h(t) = -t^2 - 2t + 30$$

Find the approximate number of seconds it will take for the rock to hit the water. Round your answer to the nearest whole number.

(A) 0

(B) 5

(C) 10

(D) 30

____ **15** Make a box-and-whisker plot of the data. Find the interquartile range.

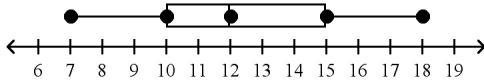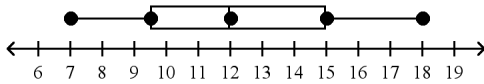$7, 9, 11, 12, 13, 15, 12, 17, 18, 12, 9, 7, 12, 15, 18, 10$
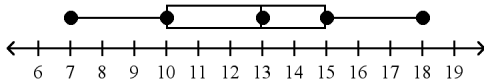
Ⓐ



Interquartile range: 5.5

Ⓑ



Interquartile range: 5

Ⓒ



Interquartile range: 5.5

Ⓓ



Interquartile range: 5
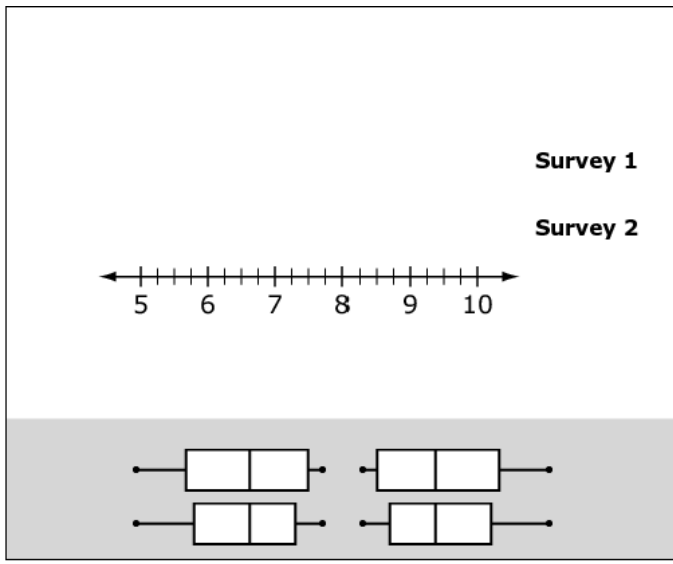
16 Eddie's Ice Cream conducts two surveys in which people are asked, on a scale of 1 to 10, how much they like the company's products.  The results of the surveys are shown.
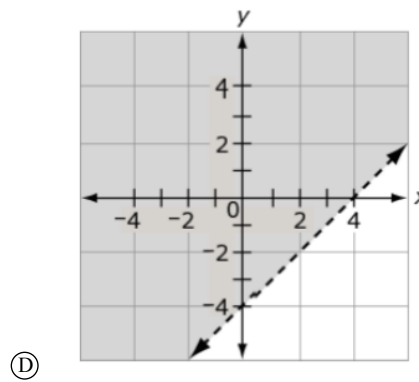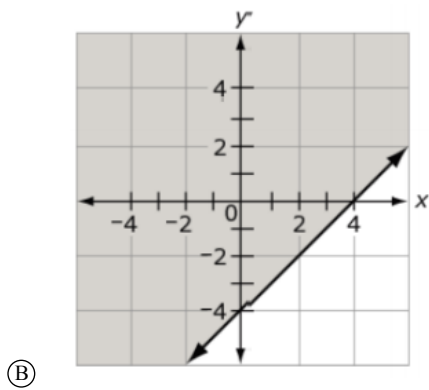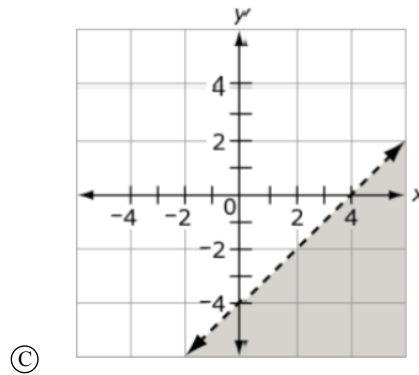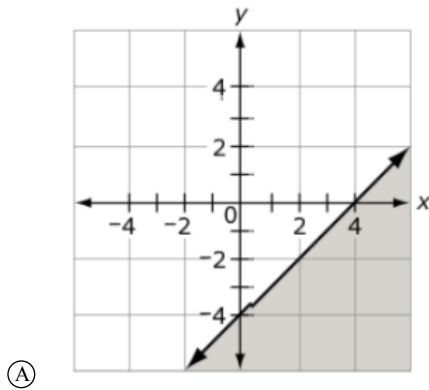
**Survey 1**: 9.2, 6.7, 7.3, 7.9, 9.5, 8.4, 8.1, 8.8, 9.0

**Survey 2:** 9.4, 6.7, 7.0, 8.1, 8.4, 9.5, 7.8, 8.6, 9.0

Draw Box Plots above the number line to represent each survey.

____ **17** Which graph represents the solution set to the inequality $y \le x - 4$?



(A)



(C)



(B)



(D)

**18** Consider the function $f(x) = 2x^2 + 6x - 8$.

**Part A**

Fill in the missing portions of the equation to rewrite $f(x)$ to reveal the vertex of the graph of the function.

Enter your answers in the boxes. Use decimals if necessary.

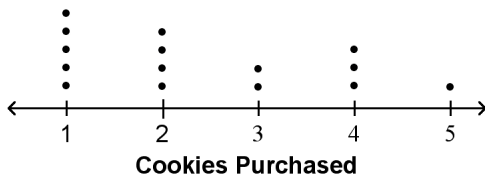$f(x) = 2(x + \boxed{\phantom{xxxxxx}})^2 + \boxed{\phantom{xxxx}}$

**Part B**

Fill in the missing portions of the equation to rewrite $f(x)$ to reveal the zeros of the function.

Enter your answers in the boxes. Use decimals if necessary

$f(x) = 2(x + \boxed{\phantom{xxxxxx}})(x + \boxed{\phantom{xxxx}})$

____ **19** The data sets below show the numbers of cookies purchased by students at a bake sale. Which of the data sets is represented by the dot plot?



**Cookies Purchased**

Ⓐ   2  2  4  4  1  1  5  1  3  2  1
Ⓑ   2  4  4  2  3  3  2  1  1  3  5  1  2  2  1
Ⓒ   1  2  1  1  2  1  2  2  3  4  5  1  3  4  4
Ⓓ   3  2  2  3  1  3  1  4  4  5  1  1  1  2  2

**20** A certain type of lily plant is growing in a pond in such a way that the number of plants is growing exponentially. The number of plants $N$ in the pond at time $t$ is modeled by the function $N(t) = ab^t$, where $a$ and $b$ are constants and $t$ is measured in months. The table shows two values of the function.

| $t$ | $N(t)$ |
| --- | --- |
| 0 | 150 |
| 1 | 450 |

Complete the equation. Enter your answer in the space provided.

▸ Numbers
▸ Arithmetic and Units
▸ Exponents, Roots, Logs
▸ Relations
▸ Geometry
▸ Groups
▸ Trigonometry
▸ Statistics

21  Monika is running around a park on a trail that is 7 miles long.  The number of miles Monika has run, *d*, after *t* minutes is modeled by the equation shown.

$$d = \frac{1}{15}t + 1$$

Mark is running around the same trail and starts at the same time as Monika. His speed is $\frac{3}{4}$ as fast as Monika's speed, and he starts a mile behind her.

Graph the equation that models Mark's run at this speed.
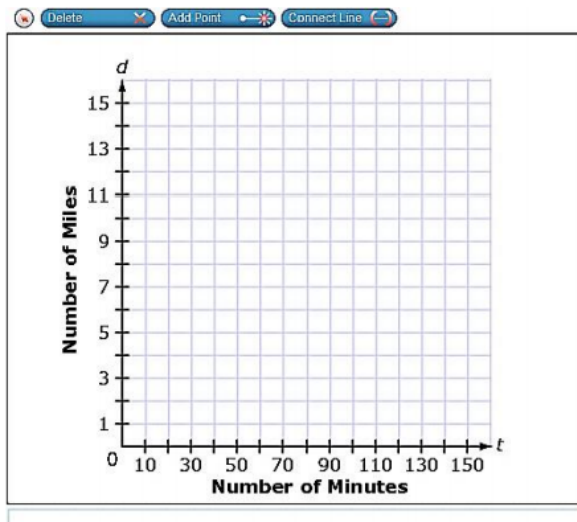


22  The formula that can be used to determine the speed of a wave pulse traveling along a string of wire is shown.

$$T = \frac{mv^2}{L}$$

Write an equation that shows the given formula solved for *v*.

23 A quadratic equation is shown.

$$x^2 + 2x - 15 = 0$$

Factor the quadratic equation to show the zeros.



_____ 24 A random sample of 200 teenagers participated in a taste test. Each teenager sampled four choices of fruit drink (labeled "A", "B", "C", and "D"), and then were asked to pick a favorite. The table shows the results of this taste test.

|       | A  | B  | C  | D  | Total |
|-------|----|----|----|----|-------|
| Boys  | 45 | 25 | 30 | 20 | 120   |
| Girls | 25 | 10 | 30 | 15 | 80    |
| Total | 70 | 35 | 60 | 35 | 200   |

Based on the information given, which of the given statements are true?

Select all that apply.

Ⓐ  40% of the participants were girls.

Ⓑ  70% of the participants preferred "A".

Ⓒ  $\frac{20}{120}$ of the boys preferred "D".

Ⓓ  $\frac{10}{35}$ of the participants who preferred "B" were girls.

Ⓔ  The proportion of boys who preferred "C" is equal to the proportion of girls who preferred "C".

____   **25** The number of calls received by a technical support center during 18 randomly selected days is listed. Identify the outlier, and describe how it affects the mean and the standard deviation.

| 50 | 57 | 77 | 66 | 53 | 72 |
|----|----|----|----|----|----|
| 51 | 88 | 82 | 70 | 62 | 64 |
| 69 | 88 | 98 | 65 | 14 | 68 |

Ⓐ   The outlier is 88. The outlier in the data set causes the mean to decrease from about 18.6 to about 13.7 and the standard deviation to increase from about 66.3 to about 69.4.

Ⓑ   The outlier is 88. The outlier in the data set causes the mean to increase from about 66.3 to about 69.4 and the standard deviation to decrease from about 18.6 to about 13.7.

Ⓒ   The outlier is 14. The outlier in the data set causes the mean to decrease from about 69.4 to about 66.3 and the standard deviation to increase from about 13.7 to about 18.6.

Ⓓ   The outlier is 14. The outlier in the data set causes the mean to decrease from about 18.6 to about 13.7 and the standard deviation to increase from about 66.3 to about 69.4.

**26** Scott records the number of people waiting at a bus stop throughout the afternoon and evening, as shown in the scatterplot

Click a number or numbers to show the y-intercept for the line of best fit.

To help solve the problem use the graph to draw the line of best fit.

____ **27** A line contains the points (0, 0) and (1, 4).

Select all the equations that represent this line.

Ⓐ  $y = x + 4$
Ⓑ  $y = 4x$
Ⓒ  $(y - 0) = 4(x - 0)$
Ⓓ  $x = 4y$
Ⓔ  $x = 0.25y$
Ⓕ  $y = 4x^2$

____ **28** Elephant Population Estimates- Namibia
Combined estimates for Etosha National Park and the Northwestern population

| Year | Base Year | Estimated Number of Elephants |
| --- | --- | --- |
| 1998 | 3 | 3,218 |
| 2000 | 5 | 3,628 |
| 2002 | 7 | 3,721 |
| 2004 | 9 | 3,571 |

The elephant population in Northwest Namibia and Etosha National Park can be predicted by the expression, $2,649(1.045)^b$, where $b$ is the number of years since 1995.

What does the value of 2,649 represent?

Ⓐ  The predicted increase in the number of elephants in the region each year
Ⓑ  The predicted number of elephants in the region in 1995
Ⓒ  The year when the elephant population is predicted to stop increasing
Ⓓ  The percentage the elephant population is predicted to increase each year

____ **29** The function *h(n)* describes the total amount of money a movie theater receives for *n* tickets sold.

Which domain is appropriate for this function?

Ⓐ  all integers
Ⓑ  all real numbers
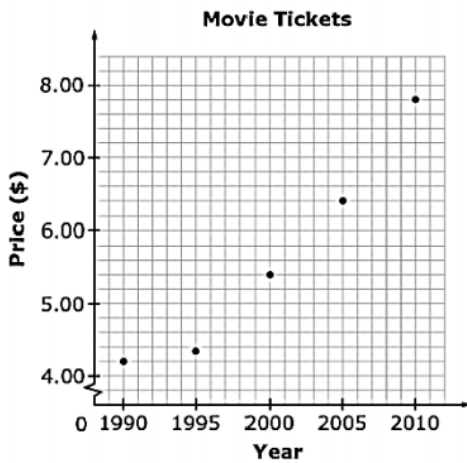Ⓒ  all positive integers and zero
Ⓓ  all positive real numbers and zero

**30** An equation is shown.

$$x^2 + 8x + 19 = 0$$

What is an equivalent equation that results from completing the square?



**31** Movie theater ticket prices from 1990 to 2010 are shown in the graph.



What is the approximate rate of change from the price of movie tickets in 1990 to the price of movie tickets in 2010, in dollars per year?

**32** What are the solutions to the equation $\frac{3}{4}x^2 = 48$?

Enter your answers in the space provided. Enter only your answers.

$$x = \square \ \text{and}\ x = \square$$

____ **33** The manager of a coffee shop suspects that as the outside temperature decreases in the evening, the number of hot beverages she sells will increase. The manager creates a model to see whether this is true.

What are the most appropriate variables for this model?

Ⓐ independent variable: number of hot beverages sold;
dependent variable: hourly outside temperature
Ⓑ independent variable: hourly outside temperature;
dependent variable: number of hot beverages sold
Ⓒ independent variable: number of hot beverages sold;
dependent variable: average evening outside temperature
Ⓓ independent variable: average evening outside temperature;
dependent variable: number of hot beverages sold

**34** A comparison of the prices of various sizes of pizza at 3 stores in one city was made. The results are shown in the table.
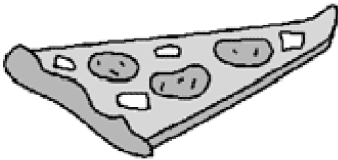
|         | Medium  | Large   | Family  |
|---------|---------|---------|---------|
| Store A | $8.55   | $11.95  | $13.95  |
| Store B | $6.25   | $6.75   | $8.25   |
| Store C | $11.70  | $15.40  | $18.60  |

In dollars, how much greater is the mean of the prices at the most expensive store than the mean at the least expensive store?

35   In a basketball game, Marlene made 18 field goals. Each of the field goals were worth either 2 points or 3 points, and Marlene scored a total of 39 points from field goals.

**Part A**

Let $x$ represent the number of two-point field goals and $y$ represent the number of three-point field goals. Write a system of equations in terms of $x$ and $y$ to model the situation.

Enter your answer in the space provided. Enter **only** your system.

| ↻ ↺ C ⌫ + − × ÷ 吕 回 $y^x$ √ = ≈ |
| --- |

- Numbers
- Arithmetic and Units
- Exponents, Roots, Logs
- Relations
- Geometry
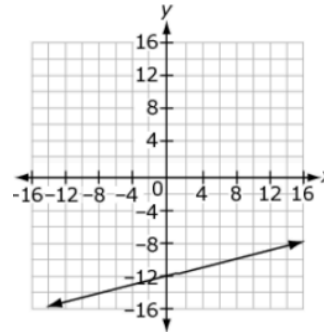- Groups
- Trigonometry
- Statistics
- Greek

**Part B**

How many three-point field goals did Marlene make in the game?
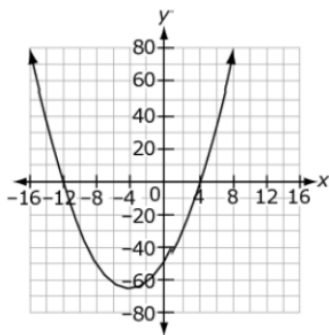
Enter your answer in the box.

____ **36** A function has an x-intercept at (4,0) and a y-intercept at (0,-12).
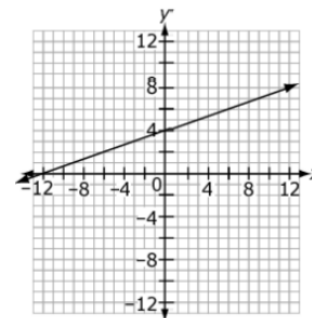Which graph could represent the function?
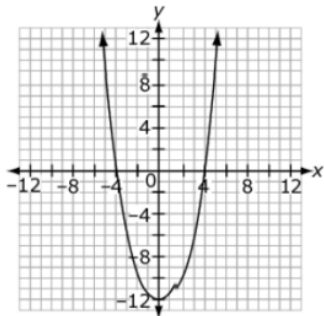


(A)



(C)



(B)



(D)

____ **37** The annual average temperature of a location depends in part on its distance from the equator. The latitude at the equator is 0. Scientists collected data from a number of locations. The line of best fit for the data is $y = 90 - x$, where $x$ is measured in degrees latitude and $y$ is measured in degrees Fahrenheit.

What is the meaning of the constant term in this equation?

Ⓐ It is the average temperature at the equator.
Ⓑ It is the rate of change in temperature at the equator.
Ⓒ It is the number of different locations where data were collected.
Ⓓ It is the rate of decrease of 1 degree in temperature for each degree in distance from the equator.

____ **38** The solution to the system of equations $x + y = 1$ and $x - y = -7$ is $(x, y) = (-3, 4)$. This solution is NOT a solution to which of the following equations?

Ⓐ $x + y - 2(x - y) = 1 - 2(-7)$
Ⓑ $3(x + y) + x - y = 3(1) - 7$
Ⓒ $x + y + 5(x - y) = 5(1) - 7$
Ⓓ $-4(x + y) + x - y = 1 - 4(-7)$
Ⓔ $x + y - x + y = 1 + 7$

_____ **39** Which quantities are most likely to have a cause-and-effect relationship?

Ⓐ The average number of televisions per household in a country and the country's average life expectancy

Ⓑ A student's grade in history class and the student's grade in math class

Ⓒ The level of nutrients in soil and the rate of plant growth

Ⓓ The amount of ice cream sold and the number of people wearing sunglasses